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**DRINKING WATER SURVEILLANCE PROGRAM**

**SOUTHAMPTON  
WATER TREATMENT  
PLANT**

**REPORT FOR 1991 AND 1992**



ISSN 1195-1125

**SOUTHAMPTON WATER TREATMENT PLANT  
DRINKING WATER SURVEILLANCE PROGRAM  
REPORT FOR 1991 AND 1992**

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## EXECUTIVE SUMMARY

### DRINKING WATER SURVEILLANCE PROGRAM

#### SOUTHAMPTON WATER TREATMENT PLANT 1992 REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

The Southampton water treatment plant is a conventional treatment plant which treats water from Lake Huron. The process consists of coagulation, flocculation, clarification (upflow clarifier), filtration and disinfection. This plant has a design capacity of  $6.3 \times 1000 \text{ m}^3/\text{day}$ . The Southampton water treatment plant serves a population of approximately 4,800.

Water at the plant and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The Southampton water treatment plant, for the sample year 1992, produced good quality water and this was maintained in the distribution system.

TABLE A  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE  
A . . . INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE		RAW		TREATED		HIGH ST	
	TESTS	%POSITIVE	TESTS	%POSITIVE	TESTS	%POSITIVE	TESTS	%POSITIVE
BACTERIOLOGICAL	27	6	22	9	0	0	9	1
CHEMISTRY (FIELD)	41	41	100	53	53	100	99	100
CHEMISTRY (LABORATORY)	207	174	84	216	159	73	357	310
METALS	215	57	26	215	51	23	391	136
CHLOROAROMATICS	122	0	0	122	0	0	125	0
CHLOROPHENOLS	6	0	0	6	0	0	0	0
PESTICIDES AND PCB	311	0	0	311	0	0	197	0
PHENOLICS	9	0	0	9	0	0	0	0
POLYAROMATIC HYDROCARBONS	17	0	0	17	0	0	17	0
SPECIFIC PESTICIDES	26	0	0	26	0	0	0	0
VOLATILES	279	30	10	279	38	13	248	33
RADIONUCLIDES	14	4	28	14	4	28	0	0
TOTAL	1,274	312	1,277	305	1,443	579		

## **DRINKING WATER SURVEILLANCE PROGRAM**

### **SOUTHAMPTON WATER TREATMENT PLANT 1992 REPORT**

#### **INTRODUCTION**

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Southampton water treatment plant in April 1992. This is the first published DWSP report.

#### **PLANT DESCRIPTION**

The Southampton water treatment plant is a conventional treatment plant which treats water from Lake Huron. The process consists of coagulation, flocculation, clarification (upflow clarifier), filtration and disinfection. This plant has a design capacity of  $6.3 \times 1000 \text{ m}^3/\text{day}$ . The Southampton water treatment plant serves a population of approximately 4,800.

The sample day flows ranged from  $1.3 \times 1000 \text{ m}^3/\text{day}$  to  $2.3 \times 1000 \text{ m}^3/\text{day}$ .

General plant information is presented in Table 1 and a schematic of plant processes, chemical addition points and sampling locations in Figure 1.

#### **SAMPLING AND ANALYSES**

Stringent DWSP sampling protocols were followed to ensure that all samples were collected in a uniform manner (see Appendix B).

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. Retention time was calculated by dividing the volume of water

between two sampling points by sample day flow. For example, if it was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

To obtain a representative raw water sample, free from any added chemicals, at plants which used chlorine for zebra mussel control, the operator was required to turn off the chlorine feed to the mouth of the intake and allow enough time for the chlorinated water to clear from the intake works.

Plant operating personnel routinely analyzed parameters for process control (Table 2).

At all distribution system locations, two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples, therefore, were laboratory chemistry and metals. The free flow sample represented fresh water from the distribution system main, since the sample tap was flushed for five minutes prior to sampling.

Water at the plant and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

## **RESULTS**

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between the raw and treated water sampling, flow rate, and treatment chemical dosages.

Table 4 is a summary of all results by parameter and by water type. If a parameter was not detected, the total number of negative sample results is given. In contrast, if a parameter was detected at any location, the detailed results for all samples are provided.



Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment and Energy laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 4 and 5. Parameters are listed alphabetically within each scan.

## DISCUSSION

### GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

The guidelines are evaluated on the results from the free flowing samples. Standing samples in the distribution system can show elevated concentrations in certain metals if the water is corrosive or if the standing time is excessive. Flushing the tap until the water achieves the coolest temperature will ensure that the water used for consumption will contain minimum concentrations of metals.

IN THIS REPORT, DISCUSSION IS LIMITED TO:

- THE TREATED AND DISTRIBUTED WATER;
- ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE  
GUIDELINE VALUES; AND
- POSITIVE ORGANIC PARAMETERS DETECTED.

### BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Standard plate count was the only bacteriological analysis conducted on the treated and distributed water. No results were above the guideline.

## INORGANIC & PHYSICAL

### CHEMISTRY (FIELD)

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of delivered water may increase in the distribution system due to the warming effect of soil in late summer and fall and/or as a result of higher temperatures in the source water.

Field temperature exceeded the ODWO Aesthetic Objective of 15°C in 4 of 18 treated and distributed water samples with a maximum reported value of 18.8°C.

### CHEMISTRY (LABORATORY)

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Recommended Operational Guideline of 80-100 mg/L in 17 of 18 treated and distributed water samples with a maximum reported value of 156 mg/L.

### METALS

At present, there is no evidence that aluminum is physiologically harmful and no health limit for drinking water has been specified. The measure of aluminum in treated water is important to measure the efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 100 ug/L as aluminum in the water leaving the plant to avoid problems in the distribution system.

Aluminum exceeded the ODWO Recommended Operational Guideline of 100 ug/L in 8 of 18 treated and distributed water samples with a maximum reported value of 170 ug/L.

## ORGANIC

### CHLOROAROMATICS

The results of the chloroaromatic scan showed that none were detected above trace levels.

## CHLOROPHENOLS

The results of the chlorophenol scan showed that one parameter was detected at a trace level.

## PESTICIDES AND PCB

The results of the pesticide and PCB scan showed that none were detected.

## PHENOLICS

The results of the phenolic test showed that none were detected above trace levels.

## POLYAROMATIC HYDROCARBONS

The results of the polyaromatic hydrocarbon scan showed that none were detected.

## SPECIFIC PESTICIDES

The results of the specific pesticide scan showed that none were detected.

## VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology. Trace levels of styrene are considered to be laboratory artifacts resulting from the sample shipping containers.

M-xylene was found at positive levels in 2 of the 17 treated and distributed water samples analyzed. The maximum observed level was 1.0 ug/L. This was below the ODWO Aesthetic Objective of 300 ug/L.

Methylene chloride was found at a positive level in 1 of the 17 treated and distributed water samples analyzed. The maximum observed level was 5.0 ug/L. This was below the ODWO Maximum Acceptable Concentration of 50 ug/L.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THM results are discussed. Starting in 1991, samples from the distribution system were quenched with sodium thiosulphate to stop the further production of THMs in the sample bottle. This provided a more representative estimation of the THMs consumed in tap water.

Total trihalomethanes were found at positive levels in all 17 treated and distributed water samples analyzed with a maximum level of 74.9 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

Trihalomethanes were detected at positive levels in all raw water samples. Where prechlorination is practiced, the operator must ensure that no chlorine is present in the lowlift chamber or discharge line and that the lowlift pumps are in operation for some time before the raw water sample is taken.

## RADIOLOGICAL

### RADIONUCLIDES

There are more than 200 radionuclides, some of which occur naturally and others which originate from the activities of society. The radionuclides currently of greater interest from a health view-point are tritium, strontium-90, iodine-131, cesium-137 and radium-226. The gross beta and gross alpha determinations are suitable for preliminary screening except for tritium which must be measured separately. Radionuclides are measured in becquerels per litre (Bq/L). No results were above the available guidelines.

### CONCLUSIONS

No known health related guidelines were exceeded.

The Southampton water treatment plant, for the sample year 1992, produced good quality water and this was maintained in the distribution system.

FIGURE 1

# SOUTHAMPTON WATER TREATMENT PLANT

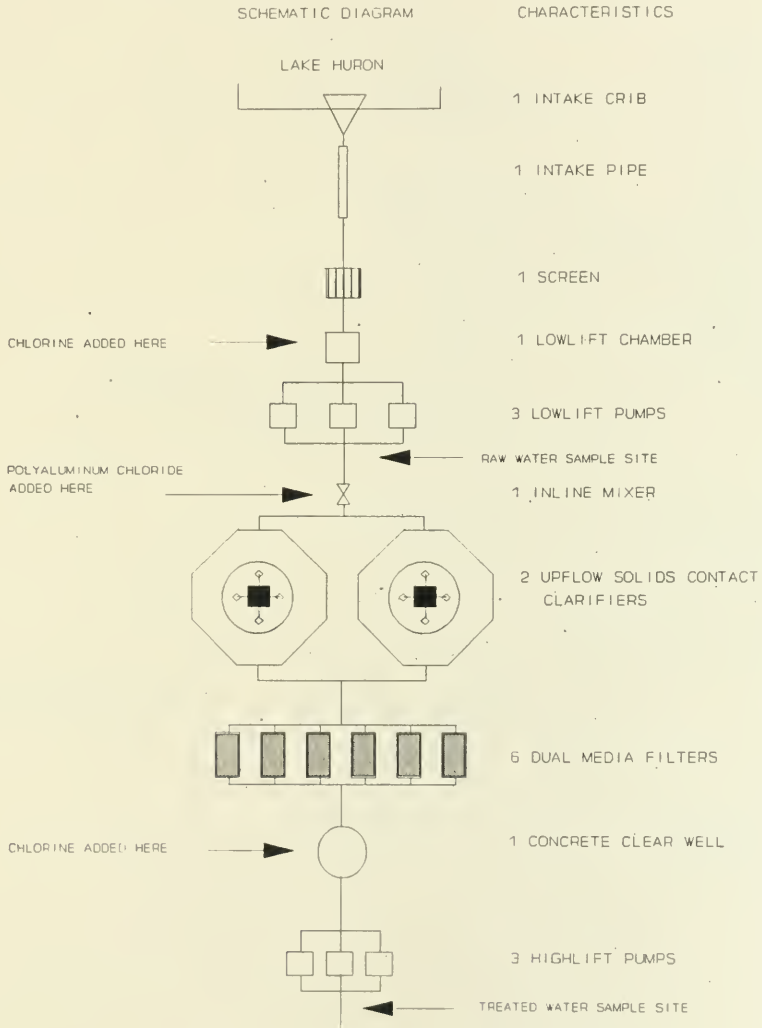


TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM

PLANT GENERAL REPORT

PLANT NAME:                   SOUTHAMPTON WTP  
 WORKS #:                    210000078  
 UTM #:                      169467304940707

DISTRICT:                   OWEN SOUND  
 REGION:                    SOUTHWEST  
 DISTRICT OFFICER:         H.W. PAGE

PUC MANAGER:               MR ROBERT MASTERSON

ADDRESS:                    SOUTHAMPTON PUBLIC UTILITIES  
                              235 HIGH STREET, P.O. BOX 1030  
                              SOUTHAMPTON, ONTARIO  
                              NOH 2L0

MUNICIPALITY:              SOUTHAMPTON  
 AUTHORITY:                 MUNICIPAL

PLANT INFORMATION

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PLANT VOLUME:	-	(X 1000 M3)
DESIGN CAPACITY:	6.300	(X 1000 M3/DAY)
RATED CAPACITY:	-	(X 1000 M3/DAY)

MUNICIPALITY  
 -----  
 SOUTHAMPTON

POPULATION  
 -----  
 4,800

TABLE 2  
DRINKING WATER SURVEILLANCE PROGRAM  
IN-PLANT MONITORING

PARAMETER -----	LOCATION -----	FREQUENCY -----
FREE CHLORINE RESIDUAL	LAB RAW RAW	3 TIMES/DAY CONTINUOUS
TOTAL CHLORINE RESIDUAL	LAB TREATED	3 TIMES/DAY
PH	RAW TREATED	VARIABLE VARIABLE
TEMPERATURE	LAB TREATED RAW TREATED	DAILY CONTINUOUS CONTINUOUS
TURBIDITY	LAB TREATED RAW SETTLED TREATED	3 TIMES/DAY CONTINUOUS CONTINUOUS CONTINUOUS

TABLE 3  
DRINKING WATER SURVEILLANCE PROGRAM SOUTHAMPTON WTP SAMPLE DAY CONDITIONS  
AND TREATMENT CHEMICAL DOSAGES FOR 1992

DATE	DELAY * TIME(HRS) (1000M3)	PRE CHLORINATION CHLORINE	COAGULATION POLYALUMINUM CHLORIDE	POST CHLORINATION CHLORINE
92 APR 07	.00	.42	6.00	1.41
92 MAY 05	24.00	.20	6.00	1.00
92 JUN 02	00	.72	6.00	1.10
92 JUL 08	24.00	.86	6.00	1.07
92 AUG 05	24.00	1.85	6.00	.87
92 SEP 09	24.00	.91	6.00	1.38
92 OCT 06	24.00	1.12	6.00	1.41
92 NOV 03	24.00	.73	12.00	1.06
92 DEC 08	24.00			

\* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.



KEY TO TABLE 4 and 5

- A ONTARIO DRINKING WATER OBJECTIVES (ODWO)  
1. Maximum Acceptable Concentration (MAC)  
1+. MAC for Total Trihalomethanes  
2. Interim Maximum Acceptable Concentration (IMAC)  
3. Aesthetic Objective (AO)  
3\*. AO for Total Xylenes  
4. Recommended Operational Guideline  
5. Health Related Guidance Value
- B HEALTH & WELFARE CANADA (H&W)  
1. Maximum Acceptable Concentration (MAC)  
2. Proposed MAC  
3. Interim MAC  
4. Aesthetic Objective (AO)
- C WORLD HEALTH ORGANIZATION (WHO)  
1. Guideline Value (GV)  
2. Tentative GV  
3. Aesthetic GV
- D US ENVIRONMENTAL PROTECTION AGENCY (EPA)  
1. Maximum Contaminant Level (MCL)  
2. Suggested No-Adverse Effect Level (SNAEL)  
3. Lifetime Health Advisory  
4. EPA Ambient Water Quality Criteria
- F EUROPEAN ECONOMIC COMMUNITY (EEC)  
1. Health Related Guideline Level  
2. Aesthetic Guideline Level  
3. Maximum Admissable Concentration (MADC)
- G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- I NEW YORK STATE AMBIENT WATER GUIDELINE
- N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

. No Sample Taken

BDL Below Minimum Measurement Amount

<T Greater Than Detection Limit But Not Confident  
(SEE INTERPRETATION OF RESULTS ABOVE)

> Results Are Greater Than The Upper Limit

<=> Approximate Result

!48 No Data: Sample Age Exceeded 48 Hours

!AR No Data: No Numeric Results

!AW No Data: Analysis Withdrawn

!BT No Data: Sample Broken In Transit

!CS No Data: Contamination Suspected

!EF No Data: Laboratory Equipment Failure

!IR No Data: Insufficient Sample

!IS No Data: Insufficient Sample

!LA No Data: Laboratory Accident

!NP No Data: No Procedure

!NR No Data: Sample Not Received

!OP No Data: Obscured Plate

!PE No Data: Procedure Error: Sample Discarded

!PR No Data: Preservative Required

!QU No Data: Quality Control Unacceptable

!RE No Data: Received Empty

!RO No Data: No Numeric Results

!SM No Data: Sample Missing

!SS No Data: Sample Improperly Preserved

!U No Data: Sample Unsuitable For Analysis

!UB No Data: Bottle Broken

!UN No Data: Result Unreliable

!UR	No Data: Unpreserved Sample Required
A	Approximate Value
A3C	Approximate, Total Count Exceeded 300 Colonies
A>	Approximate Value, Exceeded Normal Range
APS	Additional Peak, Less Than, Not Priority Pollutant
ARO	Additional Information In Laboratory Report
CRO	Calculated Result Only
NAF	Not All Required Tests Found
RID	Ioncal Calculated on Incomplete Data Set
RMP	P and M-Xylene Not Separated
RRR	Result Obtained by Repeat Analysis
RRV	Rerun Verification
SFA	Sample Filtered: Filtrate Analyzed
SIL	Sample Incorrectly Labelled
SPS	Several Peaks, Small, Not Priority Pollutant
U48	Unreliable: Sample Age Exceeded 48 Hours
UAL	Unreliable: Sample Age Exceeded Limit
UAU	Unreliable: Sample Age Unknown
UCS	Unreliable: Contamination Suspected
USD	Unreliable: Sample Decomposition Noted
WSD	Wrong Sample Description On Bottle

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
BACTERIOLOGICAL				
FECAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = 0 (A1)
1992 APR	0			
1992 MAY	0			
1992 JUN	0			
1992 JUL	0			
1992 AUG	0			
1992 SEP	0			
1992 OCT	0			
1992 NOV	0			
1992 DEC	0			
STANDARD PLATE CNT MF (CT/ML)				GUIDELINE = 500 (A3)
1992 APR	3	0	0	
1992 MAY	0	0	0	
1992 JUN	3	6	6	
1992 JUL	0	0	0	
1992 AUG	0	0	0	
1992 SEP	0	0	0	
1992 OCT	0	340	0	
1992 NOV	2	0	0	
1992 DEC	0	4	4	
TOTAL COLIFORM MF (CT/100ML)				GUIDELINE = 5/100ML (A1)
1992 APR	BOL			
1992 MAY	10 A3C			
1992 JUN	BOL			
1992 JUL	BOL			
1992 AUG	BOL			
1992 SEP	BOL			
1992 OCT	BOL			
1992 NOV	BOL			
1992 DEC	BOL			
T COLIFORM BCKGRD MF (CT/100ML)				GUIDELINE = N/A
1992 APR	BOL			
1992 MAY	900 A3C			
1992 JUN	4400 A3C			
1992 JUL	BOL			
1992 AUG	2720 A3C			
1992 SEP	BOL			
1992 OCT	4			
1992 NOV	2			
1992 DEC	BOL			

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
CHEMISTRY (FIELD)				
FLD CHLORINE (COMB) (MG/L)		DET'N LIMIT = 0	GUIDELINE = N/A	
1992 APR	.160	.200		
1992 MAY	.140		.140	
1992 JUN	.130	.100	.100	
1992 JUL	.100	.100	.100	
1992 AUG	.100	.100	.050	
1992 SEP	.140	.050	.050	
1992 OCT	.130	.180	.050	
1992 NOV	.100	.400	.100	
1992 DEC	.160	.100	.300	
FLD CHLORINE FREE (MG/L)		DET'N LIMIT = 0	GUIDELINE = N/A	
1992 APR	.940	.400		
1992 MAY	1.010	.240	.240	
1992 JUN	.060	.200	.200	
1992 JUL	.860	.300	.050	
1992 AUG	.750	.200	.100	
1992 SEP	.230	.680	.150	
1992 OCT	.090	.740	.150	
1992 NOV	.940	.600	.200	
1992 DEC	.250	.600	.100	
FLD CHLORINE (TOTAL) (MG/L)		DET'N LIMIT = 0	GUIDELINE = N/A	
1992 APR	1.100	.600		
1992 MAY	.140	.380	.380	
1992 JUN	.220	.300	.300	
1992 JUL	.990	.400	.150	
1992 AUG	.850	.300	.150	
1992 SEP	.370	.850	.200	
1992 OCT	.220	.920	.150	
1992 NOV	1.340	.800	.300	
1992 DEC	.350	.700	.400	
FLD PH (DIMSLESS)		DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5 (84)	
1992 APR	7.180	7.330		
1992 JUN	7.450	7.360	7.200	
1992 JUL	7.270	7.190	7.300	7.300
1992 AUG	7.230	7.080	7.200	7.400
1992 SEP	7.400	7.110	7.300	7.300
1992 OCT	7.510	7.610	7.300	7.400
1992 NOV	7.100	7.140	7.400	7.300
1992 DEC	7.640	7.660	7.400	7.400

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
CHEMISTRY (FIELD)				GUIDELINE = 15 (A3)
FLD TEMPERATURE (DEG.C )		DET'N LIMIT = N/A		
1992 APR	1.300	1.000		
1992 MAY	11.600	12.900	12.900	
1992 JUN	13.500	14.000	21.400	
1992 JUL	14.700	14.000	19.000	
1992 AUG	17.500	16.000	18.500	
1992 SEP	18.500	16.500	18.000	
1992 OCT	14.700	13.000	16.000	
1992 NOV	9.200	8.000	11.000	
1992 DEC	8.900	3.000	7.500	
DET'N LIMIT = N/A				GUIDELINE = 1.0 (A1)
FLD TURBIDITY (FTU )				
1992 APR	1.700	.100	.260	
1992 MAY	7.700	.150	.100	
1992 JUN	1.800	.100	.140	
1992 JUL	2.300	.080	.100	
1992 AUG	3.200	.080	.070	
1992 SEP	2.300	.070	.090	
1992 OCT	.950	.060	.150	
1992 NOV	1.100	.090	.240	
1992 DEC	1.600	.220		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
CHEMISTRY (LABORATORY)				
ALKALINITY (MG/L)		DET'N LIMIT = 0.2	GUIDELINE = 30-500 (A4)	
1992 APR	93.000	86.500	87.600	
1992 MAY	222.300	122.300	106.900	106.400
1992 JUN	99.400	96.600	96.600	98.500
1992 JUL	83.100	78.700	80.200	81.600
1992 AUG	144.400	87.100	81.300	80.500
1992 SEP	84.100	74.100	80.700	77.300
1992 OCT	106.000	105.800	88.600	99.600
1992 NOV	99.600	114.600	106.700	107.500
1992 DEC	84.800	90.300	97.200	99.600
CALCIUM (MG/L)		DET'N LIMIT = 0.20	GUIDELINE = 100 (F2)	
1992 APR	30.600	31.200	31.600	
1992 MAY	67.400	42.400	37.800	37.500
1992 JUN	33.100	34.000	33.700	34.500
1992 JUL	27.400	27.800	28.700	29.400
1992 AUG	51.500	31.500	29.400	28.000
1992 SEP	27.450	26.800	29.850	27.900
1992 OCT	35.300	37.350	32.300	35.650
1992 NOV	32.400	38.250	36.700	36.400
1992 DEC	27.900	31.650	34.700	35.400
CYANIDE (MG/L)		DET'N LIMIT = 0.001	GUIDELINE = 0.2 (A1)	
BOL				
9 SAMPLES		DET'N LIMIT = 0.20	GUIDELINE = 250 (A3)	
CHLORIDE (MG/L)				
1992 APR	7.000	12.700	12.700	
1992 MAY	11.300	13.400	12.900	13.000
1992 JUN	6.900	10.800	11.200	11.500
1992 JUL	9.500	9.800	10.000	10.400
1992 AUG	6.500	10.500	10.300	10.400
1992 SEP	7.100	11.900	11.600	12.100
1992 OCT	7.800	12.000	12.400	12.300
1992 NOV	7.500	11.600	11.600	12.000
1992 DEC	7.000	12.800	12.800	13.100

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
CHEMISTRY (LABORATORY)				
COLOUR (HZU)		DET'N LIMIT = 0.50	GUIDELINE = 5 (A3)	
1992 APR	2.000	.500 <T	1.000 <T	
1992 MAY	18.000	1.000	1.000	2.000
1992 JUN	1.500	BDL	.500 <T	.500 <T
1992 JUL	1.000 <T	1.000 <T	1.000 <T	1.000
1992 AUG	6.000	BDL	.500 <T	.500 <T
1992 SEP	BDL	BDL	BDL	BDL
1992 OCT	4.000	1.000 <T	.500 <T	1.000 <T
1992 NOV	2.000	1.500	1.000 <T	1.500
1992 DEC	.500 <T	.500 <T	1.000 <T	1.000
CONDUCTIVITY (UMHO/CM)				
		DET'N LIMIT = 1.0	GUIDELINE = 400 (F2)	
1992 APR	235	245	248	
1992 MAY	486	316	281	282
1992 JUN	252	263	261	267
1992 JUL	213	218	222	227
1992 AUG	390	251	231	229
1992 SEP	219	220	234	226
1992 OCT	264	281	267	271
1992 NOV	250	299	282	285
1992 DEC	220	254	267	273
DISS ORG CARBON (MG/L)				
		DET'N LIMIT = 0.10	GUIDELINE = 5.0 (A3)	
1992 APR	1.700	1.000	1.100	
1992 MAY	4.400	1.900	1.700	1.600
1992 JUN	1.600	1.200	1.400	1.400
1992 JUL	1.500	1.200	1.000	1.400
1992 AUG	2.500	1.100	1.000	1.000
1992 SEP	1.500	.900	1.000	1.100
1992 OCT	2.200	1.600	1.200	1.600
1992 NOV	1.800	1.800	1.600	1.900
1992 DEC	1.400	1.100	1.300	1.500
FLUORIDE (MG/L)				
		DET'N LIMIT = 0.01	GUIDELINE = 1.5 (A1)	
1992 APR	.080	.080	.060	
1992 MAY	.100	.080	.060	.080
1992 JUN	.080	.080	.080	.060
1992 JUL	.080	.060	.080	.080
1992 AUG	.100	.080	.060	.040 <T
1992 SEP	.080	.060	.060	.060
1992 OCT	.100	.080	.080	.080
1992 NOV	.080	.100	.080	.080
1992 DEC	.100	.100	.100	.100



TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

HARDNESS (MG/L)	CHEMISTRY (LABORATORY)		TREATMENT PLANT		DIST. SYSTEM		DIST. SYSTEM	
	RAW	TREATED	FREE FLOW	HIGH ST	STANDING	STANDING	STANDING	STANDING
	DET'N LIMIT = 0.5		GUIDELINE = 80-100 (A4)					
1992 APR	112.000	114.000	115.000					
1992 MAY	262.000	156.000	139.000					138.000
1992 JUN	123.000	126.000	124.000					128.000
1992 JUL	99.000	101.000	104.000					106.000
1992 AUG	198.000	117.000	107.000					105.000
1992 SEP	99.950	97.570	108.670					100.830
1992 OCT	130.000	138.000	116.940					132.000
1992 NOV	118.000	142.000	135.000					134.000
1992 DEC	101.000	116.000	126.000					130.000
TONCAL (DMNSLESS )								
	DET'N LIMIT = N/A		GUIDELINE = N/A					
1992 APR	.077	.072	.001					
1992 MAY	2.752 NAF	.714 NAF	1.191 NAF					1.189 NAF
1992 JUN	.524 NAF	.721 NAF	.562					.345 NAF
1992 JUL	1.990	1.479	.562					.363
1992 AUG	2.401 NAF	.223 NAF	.018 NAF					2.813 NAF
1992 SEP	3.081	3.316	.307					3.577
1992 OCT	.013	.290	.761					.151
1992 NOV	1.964	3.400	1.768					2.446
1992 DEC	2.062	3.115	.806					.715
POTASSIUM (MG/L )								
	DET'N LIMIT = 0.01		GUIDELINE = 10 (F2)					
1992 APR	1.050	1.060	1.080					
1992 MAY	1.400	1.110	1.130					1.110
1992 JUN	.950	.970	.990					1.000
1992 JUL	.940	1.000	.960					1.070
1992 AUG	1.250	.960	.960					.980
1992 SEP	.969	.905	.949					.951
1992 OCT	1.025	1.082	1.018					1.094
1992 NOV	.995	1.065	1.055					1.132
1992 DEC	.963	.999	1.014					1.096
LANGLIERS INDEX (DMNSLESS )								
	DET'N LIMIT = N/A		GUIDELINE = N/A					
1992 APR	.381	.244	.303					
1992 MAY	1.266	.552	.405					.409
1992 JUN	.497	.372	.379					.395
1992 JUL	.222	.153	.143					.179
1992 AUG	.751 NAF	.148 NAF	.096 NAF					.062 NAF
1992 SEP	.226	.050	.159					.084
1992 OCT	.458	.325	.108					.213
1992 NOV	.349	.463	.401					.409
1992 DEC	.096	.035	.162					.209

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
CHEMISTRY (LABORATORY)				
MAGNESIUM (MG/L)		DET'N LIMIT = 0.1	GUIDELINE = 30.0 (F2)	
1992 APR	8.670	8.800	8.790	
1992 MAY	22.800	12.300	10.800	
1992 JUN	9.690	10.100	9.770	10.900
1992 JUL	7.480	7.610	7.740	10.100
1992 AUG	17.000	9.190	8.040	7.880
1992 SEP	7.650	7.440	8.300	7.560
1992 OCT	10.290	10.910	8.810	10.200
1992 NOV	9.130	11.200	10.480	10.540
1992 DEC	7.640	8.920	9.610	10.040
SODIUM (MG/L)				
		DET'N LIMIT = 0.20	GUIDELINE = 200 (A4)	
1992 APR	4.010	4.260	4.300	
1992 MAY	5.740	4.250	4.270	4.180
1992 JUN	3.930	4.020	4.020	4.050
1992 JUL	3.590	3.660	3.630	3.770
1992 AUG	5.400	3.940	3.760	3.790
1992 SEP	3.820	3.630	3.900	3.740
1992 OCT	4.100	4.270	3.910	4.210
1992 NOV	3.910	4.220	4.160	4.200
1992 DEC	3.640	3.840	3.860	4.000
AMMONIUM TOTAL (MG/L)				
		DET'N LIMIT = 0.002	GUIDELINE = 0.05 (F2)	
1992 APR	.008 <T	BOL	BOL	.006 <T
1992 MAY	.002 <T	.004 <T	.008 <T	.002 <T
1992 JUN	.004 <T	BOL	BOL	.018
1992 JUL	.008 <T	BOL	BOL	.020
1992 AUG	.020	.002 <T	.004 <T	.010
1992 SEP	.004 <T	.004 <T	.004 <T	.020
1992 OCT	.010	.004 <T	.002 <T	.022
1992 NOV	.006 <T	.006 <T	.006 <T	.010
1992 DEC	.008 <T	.002 <T	.004 <T	
NITRITE (MG/L)				
		DET'N LIMIT = 0.001	GUIDELINE = 1.0 (A1)	
1992 APR	.003 <T	BOL	BOL	.001 <T
1992 MAY	.006	BOL	.001 <T	.001 <T
1992 JUN	.002 <T	BOL	BOL	.002 <T
1992 JUL	.001 <T	BOL	BOL	.001 <T
1992 AUG	.005	BOL	BOL	.002 <T
1992 SEP	.001 <T	BOL	BOL	.001 <T
1992 OCT	.002 <T	.001 <T	.001 <T	.003 <T
1992 NOV	.002 <T	BOL	.001 <T	.002 <T
1992 DEC	BOL	BOL	BOL	.001 <T

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST	DIST. SYSTEM FREE FLOW	DIST. SYSTEM HIGH ST	DIST. SYSTEM STANDING
CHEMISTRY (LABORATORY)					
NITRATE (TOTAL) (MG/L )					
			DET'N LIMIT = 0.005		GUIDELINE = 10.0 (A1)
1992 APR	.480	.490	.500		
1992 MAY	1.420	.730	.665		.650
1992 JUN	.385	.405	.405		.440
1992 JUL	.310	.310	.310		.370
1992 AUG	.515	.295	.285		.295
1992 SEP	.305	.295	.310		.305
1992 OCT	.375	.405	.340		.395
1992 NOV	.370	.460	.425		.480
1992 DEC	.355	.470	.510		.535
NITROGEN TOT KJELD (MG/L )					
			DET'N LIMIT = 0.02		GUIDELINE = N/A
1992 APR	.140	.070 <T	.090 <T		
1992 MAY	.450	.130	.120		.120
1992 JUN	.230	.140	.140		.150
1992 JUL	.140	.080 <T	.100		.180
1992 AUG	.300	.090 <T	.090 <T		.200
1992 SEP	.130	.090 <T	.080 <T		.100
1992 OCT	.180	.140	.110		.190
1992 NOV	.150	.130	.130		.230
1992 DEC	.140	.110	.120		.150
PH (DMNSLESS )					
			DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)
1992 APR	8.340	8.230	8.280		
1992 MAY	8.550	8.280	8.230		8.240
1992 JUN	8.400	8.280	8.290		8.290
1992 JUL	8.270	8.220	8.190		8.210
1992 AUG	8.330	8.130	8.130		8.120
1992 SEP	8.270	8.160	8.190		8.160
1992 OCT	8.310	8.160	8.070		8.090
1992 NOV	8.260	8.260	8.240		8.250
1992 DEC	8.130	8.000	8.060		8.090
PHOSPHORUS FIL REACT (MG/L )					
			DET'N LIMIT = 0.0005		GUIDELINE = N/A
1992 APR	.001 <T	BDL			
1992 MAY	.003 <T	.001 <T			
1992 JUN	.001 <T	BDL			
1992 JUL	.001 <T	BDL			
1992 AUG	BDL	BDL			
1992 SEP	.001 <T	BDL			
1992 OCT	.002 <T	BDL			
1992 NOV	.002 <T	BDL			
1992 DEC	.002 <T	BDL			

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED		DIST. SYSTEM HIGH ST		DIST. SYSTEM STANDING	
CHEMISTRY (LABORATORY)							
PHOSPHORUS TOTAL (MG/L )		DET'N LIMIT = 0.002		GUIDELINE = 0.40 (F2)			
1992 APR	.005 <T	BOL	.	.	.	.	.
1992 MAY	.036	.002 <T	.	.	.	.	.
1992 JUN	.007 <T	BOL	.	.	.	.	.
1992 JUL	.005 <T	.003 <T	.	.	.	.	.
1992 AUG	.012	BOL	.	.	.	.	.
1992 SEP	.005 <T	BOL	.	.	.	.	.
1992 OCT	.003 <T	BOL	.	.	.	.	.
1992 NOV	.004 <T	.005 <T	.	.	.	.	.
1992 DEC	.009 <T	.004 <T	.	.	.	.	.
RESIDUE FILTRATE (MG/L )		DET'N LIMIT = N/A		GUIDELINE = 500 (A3)			
1992 APR	153.000 CRO	159.000 CRO	161.000 CRO	183.000 CRO	.	.	.
1992 MAY	316.000 CRO	205.000 CRO	183.000 CRO	183.000 CRO	183.000 CRO	183.000 CRO	183.000 CRO
1992 JUN	164.000 CRO	171.000 CRO	170.000 CRO	174.000 CRO	174.000 CRO	174.000 CRO	174.000 CRO
1992 JUL	138.000 CRO	142.000 CRO	144.000 CRO	148.000 CRO	148.000 CRO	148.000 CRO	148.000 CRO
1992 AUG	253.000 CRO	163.000 CRO	153.000 CRO	149.000 CRO	149.000 CRO	149.000 CRO	149.000 CRO
1992 SEP	142.000 CRO	143.000 CRO	152.000 CRO	147.000 CRO	147.000 CRO	147.000 CRO	147.000 CRO
1992 OCT	172.000 CRO	183.000 CRO	161.000 CRO	176.000 CRO	176.000 CRO	176.000 CRO	176.000 CRO
1992 NOV	356.000 CRO	402.000 CRO	302.000 CRO	281.000 CRO	281.000 CRO	281.000 CRO	281.000 CRO
1992 DEC	143.000 CRO	165.000 CRO	174.000 CRO	177.000 CRO	177.000 CRO	177.000 CRO	177.000 CRO
SULPHATE (MG/L )		DET'N LIMIT = 0.20		GUIDELINE = 500 (A3)			
1992 APR	16.900	17.860	17.700	.	.	.	.
1992 MAY	38.970	23.510	19.490	19.350	19.350	19.350	19.350
1992 JUN	20.170	21.530	20.560	21.040	21.040	21.040	21.040
1992 JUL	16.270	17.190	17.090	17.510	17.510	17.510	17.510
1992 AUG	45.270	22.610	18.220	18.040	18.040	18.040	18.040
1992 SEP	16.900	17.420	19.020	17.850	17.850	17.850	17.850
1992 OCT	21.430	23.230	19.530	22.090	22.090	22.090	22.090
1992 NOV	18.460	23.670	22.190	21.380	21.380	21.380	21.380
1992 DEC	15.910	18.450	19.090	19.990	19.990	19.990	19.990
TURBIDITY (FTU )		DET'N LIMIT = 0.05		GUIDELINE = 1.0 (A1)			
1992 APR	1.450	.590	.330	.	.	.	.
1992 MAY	23.000	.290	.240 <T	.360	.360	.360	.360
1992 JUN	3.100	.370	.250	.450	.450	.450	.450
1992 JUL	1.620	.110 <T	.140 <T	.280	.280	.280	.280
1992 AUG	5.200 USD	.620 USD	.180 <T	.440 USD	.440 USD	.440 USD	.440 USD
1992 SEP	1.140	.390	.270	.590	.590	.590	.590
1992 OCT	.840	.370	.270	.490	.490	.490	.490
1992 NOV	1.540	.400	.330	.510	.510	.510	.510
1992 DEC	3.500	.250	.250	.520	.520	.520	.520

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED		DIST. SYSTEM FREE FLOW		DIST. SYSTEM HIGH ST STANDING	
METALS							
SILVER (UG/L )		BDL		BDL		BDL	
35 SAMPLES		BDL		BDL		BDL	
ALUMINUM (UG/L )		BDL		BDL		BDL	
1992 APR	16.000	33.000	39.000	62.000			
1992 MAY	140.000	89.000	57.000	120.000			
1992 JUN	21.000	120.000	110.000	100.000			
1992 JUL	16.000	140.000	98.000	110.000			
1992 AUG	53.000	160.000	120.000	86.000			
1992 SEP	12.000	100.000	100.000	93.000			
1992 OCT	12.000	170.000	120.000	89.000			
1992 NOV	15.000	120.000	86.000	61.000			
1992 DEC	36.000	46.000	45.000				
ARSENIC (UG/L )		BDL		BDL		BDL	
1992 APR		.610 <T	.360 <T	.250 <T	.200 <T		
1992 MAY		.520 <T	BDL	.130 <T	BDL		
1992 JUN		BDL	BDL	BDL	.210 <T		
1992 JUL		.630 <T	.170 <T	.420 <T	.340 <T		
1992 AUG		.600 <T	.340 <T	.180 <T	BDL		
1992 SEP		BDL	BDL	BDL	.400 <T		
1992 OCT		.620 <T	.300 <T	.290 <T	.200 <T		
1992 NOV		.430 <T	.190 <T	.210 <T	BDL		
1992 DEC		.560 <T	BDL				
BARIUM (UG/L )		BDL		BDL		BDL	
1992 APR		14.000	13.000	13.000	13.000		
1992 MAY		17.000	13.000	12.000	15.000		
1992 JUN		15.000	15.000	14.000	15.000		
1992 JUL		16.000	14.000	13.000	14.000		
1992 AUG		17.000	15.000	14.000	14.000		
1992 SEP		15.000	14.000	14.000	15.000		
1992 OCT		14.000	14.000	14.000	15.000		
1992 NOV		14.000	14.000	14.000	14.000		
1992 DEC		15.000	14.000	14.000	14.000		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST. FREE FLOW	DIST. SYSTEM HIGH ST. STANDING	
METALS				
BORON (UG/L)		DET'N LIMIT = 2.00	GUIDELINE = 5000 (A1)	
1992 APR	14.000 <T	13.000 <T		
1992 MAY	24.000	18.000 <T	17.000 <T	
1992 JUN	16.000 <T	15.000 <T	15.000 <T	
1992 JUL	15.000 <T	13.000 <T	15.000 <T	
1992 AUG	39.000	28.000	21.000	
1992 SEP	67.000	35.000	32.000	
1992 OCT	18.000 <T	18.000 <T	18.000 <T	
1992 NOV	12.000 <T	16.000 <T	16.000 <T	
1992 DEC	15.000 <T	14.000 <T	17.000 <T	
BERYLLIUM (UG/L)				
		DET'N LIMIT = 0.05	GUIDELINE = 6800 (D4)	
1992 APR	BDL	BDL		
1992 MAY	BDL	BDL	BDL	
1992 JUN	BDL	BDL	.060 <T	
1992 JUL	.070 <T	BDL	BDL	
1992 AUG	.090 <T	BDL	.070 <T	
1992 SEP	BDL	BDL	BDL	
1992 OCT	BDL	BDL	BDL	
1992 NOV	BDL	BDL	BDL	
1992 DEC	BDL	BDL	BDL	
CADMIUM (UG/L)				
		DET'N LIMIT = 0.05	GUIDELINE = 5.0 (A1)	
1992 APR	BDL	BDL	BDL	
1992 MAY	BDL	BDL	BDL	
1992 JUN	BDL	BDL	.080 <T	
1992 JUL	BDL	.080 <T	.110 <T	
1992 AUG	.090 <T	BDL	.070 <T	
1992 SEP	BDL	BDL	.120 <T	
1992 OCT	BDL	BDL	.090 <T	
1992 NOV	BDL	BDL	.070 <T	
1992 DEC	BDL	BDL		
COBALT (UG/L)				
		DET'N LIMIT = 0.02	GUIDELINE = N/A	
1992 APR	.180 <T	.210 <T	.240 <T	
1992 MAY	.510 <T	.220 <T	.170 <T	
1992 JUN	.080 <T	.100 <T	.090 <T	
1992 JUL	.270 <T	.240 <T	.290 <T	
1992 AUG	.380 <T	.200 <T	.220 <T	
1992 SEP	.170 <T	.150 <T	.170 <T	
1992 OCT	.310 <T	.280 <T	.290 <T	
1992 NOV	.050 <T	.060 <T	.060 <T	
1992 DEC	.070 <T	.180 <T	.100 <T	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
<b>CHROMIUM (UG/L)</b>				
		DET'N LIMIT = 0.50		GUIDELINE = 50.0 (A1)
1992 APR	BDL	BDL	BDL	
1992 MAY	3,900 <T	2,000 <T	2,100 <T	1,700 <T
1992 JUN	BDL	BDL	BDL	BDL
1992 JUL	BDL	BDL	BDL	BDL
1992 AUG	3,600 <T	2,300 <T	2,000 <T	1,500 <T
1992 SEP	3,000 <T	2,700 <T	2,900 <T	2,700 <T
1992 OCT	2,300 <T	2,300 <T	1,900 <T	2,800 <T
1992 NOV	1,100 <T	2,500 <T	2,500 <T	2,600 <T
1992 DEC	.870 <T	1,100 <T	.650 <T	1,600 <T
<b>COPPER (UG/L)</b>				
		DET'N LIMIT = 0.50		GUIDELINE = 1000 (A3)
1992 APR	.910 <T	1,100 <T	4,800 <T	
1992 MAY	1,300 <T	.990 <T	9,100	160,000
1992 JUN	1,300 <T	1,300 <T	15,000	63,000
1992 JUL	2,200 <T	.640 <T	13,000	110,000
1992 AUG	1,700 <T	.900 <T	12,000	100,000
1992 SEP	1,700 <T	1,100 <T	12,000	99,000
1992 OCT	1,300 <T	1,100 <T	13,000	94,000
1992 NOV	1,400 <T	5,800	8,800	110,000
1992 DEC	3,400 <T	1,200 <T	7,500	100,000
<b>IRON (UG/L)</b>				
		DET'N LIMIT = 6.00		GUIDELINE = 300 (A3)
1992 APR	21,000 <T	BDL	13,000 <T	
1992 MAY	250,000	BDL	6,600 <T	19,000 <T
1992 JUN	29,000 <T	BDL	23,000 <T	33,000 <T
1992 JUL	22,000 <T	BDL	14,000 <T	32,000 <T
1992 AUG	65,000	BDL	7,900 <T	30,000 <T
1992 SEP	19,000 <T	BDL	11,000 <T	30,000 <T
1992 OCT	13,000 <T	BDL	6,600 <T	30,000 <T
1992 NOV	25,000 <T	BDL	8,800 <T	19,000 <T
1992 DEC	39,000 <T	BDL	BDL	14,000 <T
<b>MERCURY (UG/L)</b>				
		DET'N LIMIT = 0.02		GUIDELINE = 1.0 (A1)
16 SAMPLES	BDL			

TABLE 4  
ORINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST. FREE FLOW	DIST. SYSTEM HIGH ST. STANDING	
METALS				
MANGANESE (UG/L )				GUIDELINE = 50.0 (A3)
1992 APR	1,500	2,200	2,300	
1992 MAY	26,000	1,800	1,970	
1992 JUN	4,100	1,500	1,100	
1992 JUL	2,900	890	2,300	
1992 AUG	5,900	1,400	2,000	
1992 SEP	1,500	990	2,200	
1992 OCT	1,000	1,100	2,000	
1992 NOV	1,400	820	2,200	
1992 DEC	2,200	1,000	2,500	
MOLYBDENUM (UG/L )				GUIDELINE = N/A
1992 APR	.410 <T	.360 <T	.380 <T	
1992 MAY	.220 <T	.320 <T	.270 <T	
1992 JUN	.270 <T	.230 <T	.520	
1992 JUL	.550	.480 <T	.510	
1992 AUG	.690	.530	.410 <T	
1992 SEP	.400 <T	.390 <T	.460 <T	
1992 OCT	.370 <T	.440 <T	.420 <T	
1992 NOV	.420 <T	.430 <T	.420 <T	
1992 DEC	.450 <T	.380 <T		
NICKEL (UG/L )				GUIDELINE = 350 (03)
1992 APR	1,400 <T	1,800 <T	1,400 <T	
1992 MAY	1,300 <T	2,000 <T	BOL	
1992 JUN	BOL	BOL	2,100	
1992 JUL	1,600 <T	1,900 <T	1,400 <T	
1992 AUG	1,400 <T	.790 <T	1,200 <T	
1992 SEP	BOL	BOL	3,900	
1992 OCT	2,400	1,900 <T	2,400	
1992 NOV	BOL	BOL	2,200	
1992 DEC	BOL	BOL		
LEAD (UG/L )				GUIDELINE = 10 (A1)
1992 APR	BOL	.180 <T	4,300	
1992 MAY	.410 <T	.590	3,600	
1992 JUN	.140 <T	.890	4,400	
1992 JUL	.230 <T	1,200 <T	5,100	
1992 AUG	.420 <T	.720	7,300	
1992 SEP	.290 <T	.830	19,000	
1992 OCT	.160 <T	.160 <T	8,900	
1992 NOV	.160 <T	.590	4,900	
1992 DEC	.260 <T	.400 <T		



TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM HIGH ST STANDING		
METALS						
ANTIMONY (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 146 (04)		
1992 APR	.510	.630	.430 <T	.470 <T		
1992 MAY	.300 <T	.160 <T	.250 <T	.510		
1992 JUN	.400 <T	.380 <T	.350 <T	.670		
1992 JUL	.450 <T	.370 <T	.390 <T	.630		
1992 AUG	.400 <T	.230 <T	.390 <T	.940		
1992 SEP	.450 <T	.410 <T	.460 <T	.570		
1992 OCT	.430 <T	.390 <T	.410 <T	.810		
1992 NOV	.500 <T	.490 <T	.470 <T	.680		
1992 DEC	.680	.670	.530			
SELENIUM (UG/L)		DET'N LIMIT = 1.00		GUIDELINE = 10 (A1)		
1992 APR	BDL	1.700 <T	BDL	BDL		
1992 MAY	BDL	BDL	BDL	BDL		
1992 JUN	BDL	BDL	BDL	1.500 <T		
1992 JUL	BDL	1.200 <T	BDL	BDL		
1992 AUG	BDL	BDL	BDL	BDL		
1992 SEP	BDL	BDL	BDL	1.800 <T		
1992 OCT	1.500 <T	1.500 <T	1.700 <T	BDL		
1992 NOV	BDL	BDL	BDL	BDL		
1992 DEC	BDL	BDL	BDL	BDL		
STRONTIUM (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = N/A		
1992 APR	120.000	120.000	120.000	160.000		
1992 MAY	460.000	190.000	160.000	180.000		
1992 JUN	160.000	170.000	170.000	130.000		
1992 JUL	110.000	110.000	120.000	130.000		
1992 AUG	540.000	180.000	130.000	120.000		
1992 SEP	120.000	100.000	130.000	180.000		
1992 OCT	190.000	210.000	160.000	180.000		
1992 NOV	150.000	210.000	180.000	180.000		
1992 DEC	110.000	140.000	150.000	160.000		
TITANIUM (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = N/A		
1992 APR	4.200 <T	3.400 <T	3.700 <T	6.300		
1992 MAY	16.000	6.900	6.500	4.200 <T		
1992 JUN	1.600 <T	1.100 <T	1.300 <T	3.300 <T		
1992 JUL	4.200 <T	3.700 <T	3.700 <T	1.300 <T		
1992 AUG	8.700	3.900 <T	3.900 <T	2.100 <T		
1992 SEP	1.500 <T	1.000 <T	1.100 <T	1.600 <T		
1992 OCT	2.800 <T	2.400 <T	2.000 <T	2.800 <T		
1992 NOV	1.800 <T	1.700 <T	1.600 <T			
1992 DEC	3.300 <T	2.400 <T	2.900 <T			

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST	DIST. SYSTEM FREE FLOW	DIST. SYSTEM HIGH ST STANDING
METALS					
THALLIUM (UG/L)		DET'N LIMIT = 0.05			
35 SAMPLES		BDL	BDL	BDL	BDL
URANIUM (UG/L)		GUIDELINE = 13 (04)			
		DET'N LIMIT = 0.05			
		BDL	BDL	BDL	BDL
1992 APR	.210 <T	BDL	BDL	BDL	BDL
1992 MAY	.540	.090 <T	.090 <T	.090 <T	.080 <T
1992 JUN	.240 <T	.080 <T	.070 <T	.070 <T	.080 <T
1992 JUL	.230 <T	.060 <T	.060 <T	.060 <T	.060 <T
1992 AUG	.330 <T	BDL	BDL	BDL	BDL
1992 SEP	.250 <T	BDL	BDL	BDL	BDL
1992 OCT	.260 <T	.120 <T	.060 <T	.060 <T	.100 <T
1992 NOV	.240 <T	.170 <T	.120 <T	.120 <T	.100 <T
1992 DEC	.220 <T	.060 <T	.070 <T	.070 <T	BDL
VANADIUM (UG/L)		GUIDELINE = N/A			
		DET'N LIMIT = 0.05			
		BDL	BDL	BDL	BDL
1992 APR	.250 <T	.120 <T	.160 <T	.160 <T	.100 <T
1992 MAY	.470 <T	BDL	BDL	BDL	.080 <T
1992 JUN	.190 <T	BDL	BDL	BDL	BDL
1992 JUL	BDL	BDL	BDL	BDL	BDL
1992 AUG	.060 <T	BDL	BDL	BDL	BDL
1992 SEP	BDL	BDL	BDL	BDL	BDL
1992 OCT	.170 <T	.120 <T	.120 <T	.120 <T	.210 <T
1992 NOV	.150 <T	.100 <T	.150 <T	.150 <T	.170 <T
1992 DEC	.260 <T	.110 <T	.120 <T	.120 <T	.160 <T
ZINC (UG/L)		GUIDELINE = 5000 (A3)			
		DET'N LIMIT = 0.20			
		BDL	BDL	BDL	BDL
1992 APR	1.900 <T	2.500	2.100	2.100	26.000
1992 MAY	5.800	3.600	5.800	5.800	14.000
1992 JUN	2.400	1.900 <T	5.200	5.200	19.000
1992 JUL	6.200	1.600 <T	5.900	5.900	38.000
1992 AUG	5.100	2.300	4.400	4.400	39.000
1992 SEP	6.500	4.100	5.400	5.400	110.000
1992 OCT	3.200	3.000	5.200	5.200	45.000
1992 NOV	3.400	3.000	1.800 <T	1.800 <T	45.000
1992 DEC	6.200	4.100	4.300	4.300	45.000

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
CHLOROAROMATICS				
HEXACHLOROBUTADIENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 450 (D4)
27 SAMPLES	BDL	BDL		
-----				
123-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A
25 SAMPLES	BDL	BDL		
-----				
1234-TETCHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A
25 SAMPLES	BDL	BDL		
-----				
1235-TETCHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A
24 SAMPLES	BDL	BDL		
-----				
124-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = 10000 (I)
25 SAMPLES	BDL	BDL		
-----				
1245-TETCHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 38000 (D4)
27 SAMPLES	BDL	BDL		
-----				
135-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A
27 SAMPLES	BDL	BDL		
-----				
HEXACHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 10 (C1)
27 SAMPLES	BDL	BDL		
-----				
HEXACHLOROETHANE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 1900 (D4)
1992 APR	BDL	5.000 <T	BDL	
1992 MAY	BDL	BDL	2.000 <T	
1992 JUN	BDL	3.000 <T	2.000 <T	
1992 JUL	BDL	BDL	BDL	
1992 AUG	BDL	BDL	1.000 <T	
1992 SEP	BDL	BDL	BDL	
1992 OCT	BDL	BDL	BDL	
1992 NOV	BDL	2.000 <T	2.000 <T	
1992 DEC	BDL	BDL	1.000 <T	
-----				
OCTACHLOROSTYRENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A
27 SAMPLES	BDL	BDL	BDL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
CHLOROAROMATICS				
PENTACHLOROBENZENE (NG/L )		DET'N LIMIT = 1.000	GUIDELINE = 74000 (D4)	
27 SAMPLES	BDL	BDL		
236-TRICHLOROTOLUENE (NG/L )		DET'N LIMIT = 5.000	GUIDELINE = N/A	
27 SAMPLES	BDL	BDL		
245-TRICHLOROTOLUENE (NG/L )		DET'N LIMIT = 5.000	GUIDELINE = N/A	
27 SAMPLES	BDL	BDL		
264-TRICHLOROTOLUENE (NG/L )		DET'N LIMIT = 5.000	GUIDELINE = N/A	
27 SAMPLES	BDL	BDL		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
CHLOROPHENOLS				
234-TRICHLOROPHENOL (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = N/A
2 SAMPLES	BDL			
2345-TETCHLOROPHENOL (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A
2 SAMPLES	BDL			
2356-TETCHLOROPHENOL (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A
2 SAMPLES	BDL			
245-TRICHLOROPHENOL (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = 2600000 (D4)
2 SAMPLES	BDL			
246-TRICHLOROPHENOL (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = 5000 (A1)
1992 NOV	BDL			
	30.000 <T			
PENTACHLOROPHENOL (NG/L)		DET'N LIMIT = 10.00		GUIDELINE = 60000 (A1)
2 SAMPLES	BDL			

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST	DIST. SYSTEM FREE FLOW	DIST. SYSTEM STANDING	
PESTICIDES AND PCB					
ALDRIN (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 700 (A1)	
27 SAMPLES	BDL	BDL	BDL		
ALPHA BHC (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 700 (G)	
1992 APR	1.000 <T	1.000 <T	1.000 <T		
1992 MAY	BDL	BDL	BDL		
1992 JUN	BDL	1.000 <T	BDL		
1992 JUL	1.000 <T	1.000 <T	1.000 <T		
1992 AUG	BDL	1.000 <T	BDL		
1992 SEP	BDL	BDL	1.000 <T		
1992 OCT	BDL	1.000 <T	BDL		
1992 NOV	BDL	BDL	BDL		
1992 DEC	1.000 <T	1.000 <T	BDL		
BETA BHC (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 300 (G)	
27 SAMPLES	BDL	BDL	BDL		
LINDANE (GAMMA BHC) (NG/L)			DET'N LIMIT = 1.000	GUIDELINE = 4000 (A1)	
27 SAMPLES	BDL	BDL	BDL		
ALPHA CHLORDANE (NG/L)			DET'N LIMIT = 2.000	GUIDELINE = 7000 (A1)	
27 SAMPLES	BDL	BDL	BDL		
GAMMA CHLORDANE (NG/L)			DET'N LIMIT = 2.000	GUIDELINE = 7000 (A1)	
27 SAMPLES	BDL	BDL	BDL		
DIELDRIN (NG/L)			DET'N LIMIT = 2.000	GUIDELINE = 700 (A1)	
27 SAMPLES	BDL	BDL	BDL		
METHOXYCHLOR (NG/L)			DET'N LIMIT = 5.0	GUIDELINE = 900000 (A1)	
27 SAMPLES	BDL	BDL	BDL		
ENDOSULFAN I (NG/L)			DET'N LIMIT = 2.000	GUIDELINE = 74000 (D4)	
27 SAMPLES	BDL	BDL	BDL		
ENDOSULFAN II (NG/L)			DET'N LIMIT = 5.000	GUIDELINE = 74000 (D4)	
27 SAMPLES	BDL	BDL	BDL		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST. FREE FLOW	DIST. SYSTEM HIGH ST. STANDING	
PESTICIDES AND PCB				
ENDRIN (NG/L)		DET'N LIMIT = 5.000	GUIDELINE = 1600 (D3)	
27 SAMPLES	80L	80L		
ENDOSULFAN SULPHATE (NG/L)				
		DET'N LIMIT = 5.00	GUIDELINE = N/A	
27 SAMPLES	80L	80L		
HEPTACHLOR EPOXIDE (NG/L)				
		DET'N LIMIT = 1.000	GUIDELINE = 3000 (A1)	
22 SAMPLES	80L	80L		
HEPTACHLOR (NG/L)				
		DET'N LIMIT = 1.000	GUIDELINE = 3000 (A1)	
27 SAMPLES	80L	80L		
MIREX (NG/L)				
		DET'N LIMIT = 5.000	GUIDELINE = N/A	
27 SAMPLES	80L	80L		
OXYCHLORANE (NG/L)				
		DET'N LIMIT = 2.000	GUIDELINE = N/A	
27 SAMPLES	80L	80L		
O,P-DDT (NG/L)				
		DET'N LIMIT = 5.000	GUIDELINE = 30000 (A1)	
27 SAMPLES	80L	80L		
PCB (NG/L)				
		DET'N LIMIT = 20.00	GUIDELINE = 3000 (A2)	
25 SAMPLES	80L	80L		
P,P-DDD (NG/L)				
		DET'N LIMIT = 5.000	GUIDELINE = 30000 (A1)	
27 SAMPLES	80L	80L		
P,P-DDE (NG/L)				
		DET'N LIMIT = 1.000	GUIDELINE = 30000 (A1)	
27 SAMPLES	80L	80L		
P,P-DDT (NG/L)				
		DET'N LIMIT = 5.000	GUIDELINE = 30000 (A1)	
27 SAMPLES	80L	80L		
TOXAPHENE (NG/L)				
		DET'N LIMIT = 500.0	GUIDELINE = 5000 (A1)	
27 SAMPLES	80L	80L		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
PESTICIDES AND PCB				
AMETRINE (NG/L )		DET'N LIMIT = 50.0	GUIDELINE = 300000 (D3)	
18 SAMPLES	BDL			
-----				
ATRAZINE (NG/L )		DET'N LIMIT = 50.0	GUIDELINE = 60000 (A2)	
1992 APR	BDL			
1992 MAY	BDL			
1992 JUN	BDL			
1992 JUL	BDL			
1992 AUG	80.000 <T			
1992 SEP	BDL			
1992 OCT	BDL			
1992 NOV	BDL			
1992 DEC	BDL			
-----				
ATRATONE (NG/L )		DET'N LIMIT = 50.0	GUIDELINE = N/A	
18 SAMPLES	BDL			
-----				
CYANAZINE (BLADEX) (NG/L )		DET'N LIMIT = 100.0	GUIDELINE = 10000 (A2)	
18 SAMPLES	BDL			
-----				
DESETHYL ATRAZINE (NG/L )		DET'N LIMIT = 200.0	GUIDELINE = 60000 (A2)	
18 SAMPLES	BDL			
-----				
DESETHYL SIMAZINE (NG/L )		DET'N LIMIT = 200.0	GUIDELINE = 10000 (A2)	
18 SAMPLES	BDL			
-----				
PROMETONE (NG/L )		DET'N LIMIT = 50.000	GUIDELINE = 52500 (D3)	
18 SAMPLES	BDL			
-----				
PROPACINE (NG/L )		DET'N LIMIT = 50.000	GUIDELINE = 700000 (D3)	
18 SAMPLES	BDL			
-----				
PROMETRYNE (NG/L )		DET'N LIMIT = 50.000	GUIDELINE = 1000 (A2)	
18 SAMPLES	BDL			
-----				
METRIBUZIN (SENCOR) (NG/L )		DET'N LIMIT = 100.0	GUIDELINE = 80000 (A1)	
16 SAMPLES	BDL			



TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST. FREE FLOW	DIST. SYSTEM HIGH ST. STANDING	
PESTICIDES AND PCB				
SIMAZINE (NG/L )		DET'N LIMIT = 50.00	GUIDELINE = 10000 (A2)	
18 SAMPLES	BDL	BDL		
ALACHLOR (LASSO) (NG/L )		DET'N LIMIT = 500.0	GUIDELINE = 5000 (A2)	
18 SAMPLES	BDL	BDL		
METOLACHLOR (NG/L )		DET'N LIMIT = 500.0	GUIDELINE = 50000 (A2)	
18 SAMPLES	BDL	BDL		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST FREE FLOW	DIST. SYSTEM HIGH ST STANDING
-----			
PHENOLICS		DET'N LIMIT = 0.2	
)		GUIDELINE	
PHENOLICS (UG/L)			
1992 APR	BDL	BDL	*
1992 MAY	BDL	BDL	*
1992 JUN	BDL	BDL	*
1992 JUL	BDL	.400 <T	*
1992 AUG	BDL	.400 <T	*
1992 SEP	BDL	BDL	*
1992 OCT	BDL	BDL	*
1992 NOV	.600 <T	BDL	*
1992 DEC	BDL	.600 <T	*

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST. FREE FLOW	DIST. SYSTEM HIGH ST. STANDING	
POLYAROMATIC HYDROCARBONS				
PHENANTHRENE (NG/L)		DET'N LIMIT = 10.0	GUIDELINE = N/A	
3 SAMPLES	BDL	BDL		
ANTHRACENE (NG/L)		DET'N LIMIT = 1.0	GUIDELINE = N/A	
3 SAMPLES	BDL	BDL		
FLUORANTHRENE (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = 42000 (D4)	
3 SAMPLES	BDL	BDL		
PYRENE (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
3 SAMPLES	BDL	BDL		
BENZO(A)ANTHRACENE (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
3 SAMPLES	BDL	BDL		
CHRYSENE (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = N/A	
3 SAMPLES	BDL	BDL		
DIMETH. BENZ(A)ANTHR (NG/L)		DET'N LIMIT = 5.0	GUIDELINE = N/A	
3 SAMPLES	BDL	BDL		
BENZO(E) PYRENE (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = N/A	
3 SAMPLES	BDL	BDL		
BENZO(B) FLUORANTHEN (NG/L)		DET'N LIMIT = 10.0	GUIDELINE = N/A	
3 SAMPLES	BDL	BDL		
PERYLENE (NG/L)		DET'N LIMIT = 10.0	GUIDELINE = N/A	
3 SAMPLES	BDL	BDL		
BENZO(K) FLUORANTHEN (NG/L)		DET'N LIMIT = 1.0	GUIDELINE = N/A	
3 SAMPLES	BDL	BDL		
BENZO(A) PYRENE (NG/L)		DET'N LIMIT = 5.0	GUIDELINE = 10 (A1)	
3 SAMPLES	BDL	BDL		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
POLYAROMATIC HYDROCARBONS				
BENZO(G, H, I) PERYLEN (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A
3 SAMPLES	BDL	BDL		
DIBENZO(A, H) ANTHRAC (NG/L )		DET'N LIMIT = 10.0		GUIDELINE = N/A
3 SAMPLES	BDL	BDL		
INDENO(1,2,3-C,D) PY (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A
3 SAMPLES	BDL	BDL		
BENZO(B) CHRYSENE (NG/L )		DET'N LIMIT = 2.0		GUIDELINE = N/A
3 SAMPLES	BDL	BDL		
CORONENE (NG/L )		DET'N LIMIT = 10.0		GUIDELINE = N/A
3 SAMPLES	BDL	BDL		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
SPECIFIC PESTICIDES				
2,4,5-T (NG/L )		DET'N LIMIT = 50.0	GUIDELINE = 280000 (A1)	
2 SAMPLES	80L			
2,4-D (NG/L )		DET'N LIMIT = 100.0	GUIDELINE = 100000 (A1)	
2 SAMPLES	80L			
2,4-DB (NG/L )		DET'N LIMIT = 200.0	GUIDELINE = N/A	
2 SAMPLES	80L			
2,4 D PROTONIC ACID (NG/L )		DET'N LIMIT = 100.0	GUIDELINE = N/A	
2 SAMPLES	80L			
DICAMBA (NG/L )		DET'N LIMIT = 50.0	GUIDELINE = 120000 (A1)	
2 SAMPLES	80L			
2,4,5-TP (SILVEX) (NG/L )		DET'N LIMIT = 20.00	GUIDELINE = 10000 (A1)	
2 SAMPLES	80L			
DIAZINON (NG/L )		DET'N LIMIT = 20.0	GUIDELINE = 20000 (A1)	
2 SAMPLES	80L			
DICHLOROVOS (NG/L )		DET'N LIMIT = 20.0	GUIDELINE = N/A	
2 SAMPLES	80L			
CHLORPYRIFOS (NG/L )		DET'N LIMIT = 20.0	GUIDELINE = N/A	
2 SAMPLES	80L			
ETHION (NG/L )		DET'N LIMIT = 20.0	GUIDELINE = 35000 (G)	
2 SAMPLES	80L			
MALATHION (NG/L )		DET'N LIMIT = 20.0	GUIDELINE = 190000 (A1)	
2 SAMPLES	80L			
MEVINPHOS (NG/L )		DET'N LIMIT = 20.0	GUIDELINE = N/A	
2 SAMPLES	80L			

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
SPECIFIC PESTICIDES				
METHYL PARATHION (NG/L )		DET'N LIMIT = 50.0	GUIDELINE = 9000 (D3)	
2 SAMPLES	BDL			
METHYLTRITHION (NG/L )		DET'N LIMIT = 20.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
PARATHION (NG/L )		DET'N LIMIT = 20.0	GUIDELINE = 50000 (A1)	
2 SAMPLES	BDL			
PHORATE (NG/L )		DET'N LIMIT = 20.0	GUIDELINE = 2000 (A2)	
2 SAMPLES	BDL			
RELDAN (NG/L )		DET'N LIMIT = 20.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
RONNEL (NG/L )		DET'N LIMIT = 20.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
CARBOFURAN (NG/L )		DET'N LIMIT = 2000.0	GUIDELINE = 90000 (A1)	
2 SAMPLES	BDL			
CHLOROPROPHAM (CIPC) (NG/L )		DET'N LIMIT = 2000.0	GUIDELINE = 350000 (G)	
2 SAMPLES	BDL			
DIALLATE (NG/L )		DET'N LIMIT = 2000.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
EPTAM (NG/L )		DET'N LIMIT = 2000.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
IPC (NG/L )		DET'N LIMIT = 2000.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
PROPOXUR (NG/L )		DET'N LIMIT = 2000.0	GUIDELINE = 140000 (D3)	
2 SAMPLES	BDL			

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
SPECIFIC PESTICIDES				
CARBARYL (NG/L )		DET'N LIMIT = 200.0	GUIDELINE = 90000 (A1)	
2 SAMPLES	BDL			
BUTYLATE (NG/L )		DET'N LIMIT = 2000.0	GUIDELINE = 245000 (03)	
2 SAMPLES	BDL			

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
VOLATILES				
BENZENE (UG/L )		DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)	
1992 APR	BDL	BDL	.	
1992 MAY	BDL	BDL	.	
1992 JUN	BDL	BDL	.	
1992 JUL	BDL	BDL	.	
1992 AUG	.050 <T	BDL	.	
1992 SEP	BDL	BDL	.	
1992 OCT	BDL	BDL	.	
1992 NOV	BDL	BDL	.	
1992 DEC	BDL	BDL	.	
TOLUENE (UG/L )				
		DET'N LIMIT = 0.05	GUIDELINE = 24 (A3)	
1992 APR	BDL	.050 <T	.	
1992 MAY	BDL	.050 <T	.	
1992 JUN	BDL	BDL	.	
1992 JUL	.100 <T	.100 <T	.	
1992 AUG	.250 <T	.150 <T	.	
1992 SEP	.050 <T	.150 <T	.	
1992 OCT	.050 <T	.100 <T	.	
1992 NOV	BDL	.100 <T	.	
1992 DEC	BDL	.050 <T	.	
ETHYLBENZENE (UG/L )				
		DET'N LIMIT = 0.05	GUIDELINE = 2.4 (A3)	
1992 APR	BDL	.300 <T	.	
1992 MAY	.100 <T	.300 <T	.	
1992 JUN	.050 <T	.150 <T	.	
1992 JUL	.100 <T	.150 <T	.	
1992 AUG	.150 <T	.200 <T	.	
1992 SEP	.100 <T	.150 <T	.	
1992 OCT	.100 <T	.200 <T	.	
1992 NOV	.050 <T	.050 <T	.	
1992 DEC	.100 <T	.150 <T	.	
P-XYLENE (UG/L )				
		DET'N LIMIT = 0.10	GUIDELINE = 300 (A3*)	
26 SAMPLES	BDL	BDL	.	



TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT TREATED DIST. SYSTEM HIGH ST  
RAW FREE FLOW STANDING

VOLATILES

M-XYLENE (UG/L ) DET'N LIMIT = 0.10 GUIDELINE = 300 (A3\*)

1992 APR	BOL	1,000 RMP	1,000	*
1992 MAY	BOL	.500 <T	.500	*
1992 JUN	BOL	.100 <T	.100	*
1992 JUL	BOL	.100 <T	BOL	*
1992 AUG	.200 <T	.100 <T	.200	*
1992 SEP	BOL	.200 <T	.200	*
1992 OCT	BOL	.200 <T	.200	*
1992 NOV	BOL	.400 <T	.400	*
1992 DEC	BOL	BOL	BOL	*

O-XYLENE (UG/L ) DET'N LIMIT = 0.05 GUIDELINE = 300 (A3\*)

1992 APR	BOL	.450 <T	.450	*
1992 MAY	BOL	.350 <T	.350	*
1992 JUN	BOL	.100 <T	.250	*
1992 JUL	BOL	.050 <T	.050	*
1992 AUG	.100 <T	.050 <T	.150	*
1992 SEP	BOL	.100 <T	.200	*
1992 OCT	BOL	.300 <T	.300	*
1992 NOV	BOL	BOL	BOL	*
1992 DEC	BOL	BOL	BOL	*

STYRENE (UG/L ) DET'N LIMIT = 0.05 GUIDELINE = 100 (D1)

1992 APR	BOL	BOL	BOL	*
1992 MAY	.150 <T	BOL	.150	*
1992 JUN	.150 <T	BOL	.150	*
1992 JUL	.100 <T	BOL	.150	*
1992 AUG	.250 <T	BOL	.150	*
1992 SEP	.100 <T	BOL	.250	*
1992 OCT	.200 <T	BOL	.250	*
1992 NOV	BOL	BOL	BOL	*
1992 DEC	.100 <T	BOL	.200	*

1,1-DICHLOROETHYLENE (UG/L ) DET'N LIMIT = 0.100 GUIDELINE = 7 (D1)

26 SAMPLES	BOL	BOL	BOL	*
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TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
VOLATILES				
METHYLENE CHLORIDE (UG/L)				GUIDELINE = 50 (A1)
1992 APR	BOL	BOL	BOL	
1992 MAY	BOL	BOL	BOL	
1992 JUN	BOL	BOL	BOL	
1992 JUL	BOL	5,000	BOL	
1992 AUG	BOL	BOL	BOL	
1992 SEP	BOL	BOL	BOL	
1992 OCT	BOL	BOL	BOL	
1992 NOV	BOL	BOL	BOL	
1992 DEC	BOL	BOL	BOL	
T12-DICHLOROETHYLENE (UG/L)				GUIDELINE = 70 (01)
26 SAMPLES	BOL	BOL	BOL	
1,1-DICHLOROETHANE (UG/L)				GUIDELINE = N/A
26 SAMPLES	BOL	BOL	BOL	
CHLOROFORM (UG/L)				GUIDELINE = 350 (A1+)
1992 APR	2,300	23,100	12,500	
1992 MAY	11,700	64,300		
1992 JUN	6,200	25,800	33,000	
1992 JUL	5,700	12,900	11,800	
1992 AUG	11,200	21,200	19,100	
1992 SEP	8,200	11,900	20,600	
1992 OCT	9,800	35,200	26,800	
1992 NOV	18,700	49,200	33,700	
1992 DEC	10,200	24,100	16,100	
111, TRICHLOROETHANE (UG/L)				GUIDELINE = 200 (01)
26 SAMPLES	BOL	BOL	BOL	
1,2 DICHLOROETHANE (UG/L)				GUIDELINE = 5 (A1)
26 SAMPLES	BOL	BOL	BOL	
CARBON TETRACHLORIDE (UG/L)				GUIDELINE = 5 (A1)
26 SAMPLES	BOL	BOL	BOL	
1,2-DICHLOROPROPANE (UG/L)				GUIDELINE = 5 (01)
26 SAMPLES	BOL	BOL	BOL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST FREE FLOW	DIST. SYSTEM HIGH ST STANDING	
VOLATILES				
TRICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 50 (A1)	
26 SAMPLES	BDL	BDL		
DICHLOROBROMOMETHANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 350 (A1+)	
1992 APR	1.300	8.850	5.250	
1992 MAY	.700	9.500		
1992 JUN	2.350	9.700	9.050	
1992 JUL	5.300	9.000	7.950	
1992 AUG	1.750	9.550	9.450	
1992 SEP	6.050	7.900	9.750	
1992 OCT	2.950	10.300	11.050	
1992 NOV	7.450	10.000	8.050	
1992 DEC	8.050	9.550	6.200	
1,1,2-TRICHLOROETHANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 0.6 (D4)	
26 SAMPLES	BDL	BDL		
CHLOROTRIBROMOMETHANE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)	
1992 APR	BDL	2.300	1.500	
1992 MAY	BDL	1.100		
1992 JUN	.400 <T	2.600	2.100	
1992 JUL	2.700	4.100	3.600	
1992 AUG	BDL	3.500	3.800	
1992 SEP	2.900	4.300	4.400 APS	
1992 OCT	.600 <T	2.500	4.800	
1992 NOV	1.500	1.500	1.600	
1992 DEC	3.500	2.600	1.900	
TETRACHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 65 (A5)	
26 SAMPLES	BDL	BDL		
BROMOFORM (UG/L)		DET'N LIMIT = 0.20	GUIDELINE = 350 (A1+)	
26 SAMPLES	BDL	BDL		
1,1,2,2-TETRACHLOROETHANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 0.17 (D4)	
26 SAMPLES	BDL	BDL		
VINYL CHLORIDE (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 2 (D1)	
26 SAMPLES	BDL	BDL		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST FREE FLOW	DIST. SYSTEM HIGH ST STANDING
VOLATILES			
C12-DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 70 (D1)
26 SAMPLES	BDL	BDL	
CHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 1510 (O3)
26 SAMPLES	BDL	BDL	
1,4-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 5 (A1)
26 SAMPLES	BDL	BDL	
1,3-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 3750 (O3)
26 SAMPLES	BDL	BDL	
1,2-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 200 (A1)
26 SAMPLES	BDL	BDL	
ETHYLENE DIBROMIDE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 50 (D1)
26 SAMPLES	BDL	BDL	
TOTL TRIHALOMETHANES (UG/L)		DET'N LIMIT = 0.50	GUIDELINE = 350 (A1)
1992 APR	3.600 <T	19.250	
1992 MAY	12.400	74.900	
1992 JUN	8.950	43.100	
1992 JUL	13.700	26.000	
1992 AUG	12.950	34.250	
1992 SEP	17.150	24.100	
1992 OCT	13.350	48.000	
1992 NOV	27.650	60.700	
1992 DEC	21.750	36.250	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1992 SOUTHAMPTON WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM HIGH ST FREE FLOW	DIST. SYSTEM HIGH ST STANDING
RADIONUCLIDES			
COBALT 60 (BQ/L )		DET'N LIMIT = 0.70	GUIDELINE = N/A
4 SAMPLES	BDL		
CESIUM 134 (BQ/L )		DET'N LIMIT = 0.70	GUIDELINE = N/A
4 SAMPLES	BDL		
CESIUM 137 (BQ/L )		DET'N LIMIT = 0.70	GUIDELINE = 50 (A1)
4 SAMPLES	BDL		
GROSS ALPHA COUNT (BQ/L )		DET'N LIMIT = 0.04	GUIDELINE = 0.55 (D1)
4 SAMPLES	BDL		
GROSS BETA COUNT (BQ/L )		DET'N LIMIT = 0.04	GUIDELINE = N/A
1992 MAY	.070		
1992 AUG	.080		
TRITIUM (BQ/L )		DET'N LIMIT = 7.00	GUIDELINE = 40000 (A1)
1992 MAY	9.000		
1992 AUG	16.000		
IODINE 131 (BQ/L )		DET'N LIMIT = 0.70	GUIDELINE = 10 (A1)
4 SAMPLES	BDL		

TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML (A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML (A1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A
FIELD PH	DMNSLESS	N/A	6.5-8.5 (A4)
FIELD TEMPERATURE	DEG.C	N/A	15.0 (A3)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	0.20	30-500 (A4)
AMMONIUM TOTAL	MG/L	0.002	0.05 (F2)
CALCIUM	MG/L	0.20	100.0 (F2)
CHLORIDE	MG/L	0.20	250.0 (A3)
COLOUR	TCU	0.50	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.00	400.0 (F2)
CYANIDE	MG/L	0.001	0.2 (A1)
DISSOLVED ORGANIC CARBON	MG/L	0.10	5.0 (A3)
FLUORIDE	MG/L	0.01	1.5* (A1)
HARDNESS	MG/L	0.50	80-100 (A4)
IONCAL	DMNSLESS	N/A	N/A
LANGELIERS INDEX	DMNSLESS	N/A	N/A
MAGNESIUM	MG/L	0.10	30.0 (F2)
NITRATES (TOTAL)	MG/L	0.005	10.0 (A1)
NITRITE	MG/L	0.001	1.0 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A
PH	DMNSLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A
PHOSPHORUS TOTAL	MG/L	0.002	0.4 (F2)
POTASSIUM	MG/L	0.010	10.0 (F2)
RESIDUE FILTRATE (CALCULATED TDS)	MG/L	N/A	500.0 (A3)
SODIUM	MG/L	0.20	200.0 (A4)
SULPHATE	MG/L	0.20	500.0 (A4)
TURBIDITY	FTU	0.05	1.0 (A1)

\* The Maximum Acceptable Concentration (MAC) for naturally occurring fluoride in drinking water is 2.4 mg/L.

#### CHLOROAROMATICS

1,2,3-TRICHLOROBENZENE	NG/L	5.0	N/A
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,4-TRICHLOROBENZENE	NG/L	5.0	10000 (I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.0	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.0	N/A
2,3,6-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,6A-TRICHLOROTOLUENE	NG/L	5.0	N/A
HEXACHLOROBENZENE (HCB)	NG/L	1.0	10 (C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450 (D4)
HEXACHLOROETHANE	NG/L	1.0	1900 (D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A
PENTACHLOROBENZENE	NG/L	1.0	74000 (D4)

#### CHLOROPHENOLS

2,3,4-TRICHLOROPHENOL	NG/L	100.0	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	20.0	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	10.0	N/A

TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
2,4,5-TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)
METALS			
ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMIUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	N/A
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)
POLYNUCLEAR AROMATIC HYDROCARBONS			
ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A
PESTICIDES & PCB			
ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALDRIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRAZONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DESETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADEX)	NG/L	100.0	10000 (A2)
DIELDRIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A

TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000 (D4)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	30000 (A1)
O,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDE	NG/L	1.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPAZINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
DESETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	N/A
SPECIFIC PESTICIDES			
2,4 D PROPIONIC ACID	NG/L	100.0	N/A
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.0	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.0	100000 (A1)
2,4-DICHLOROPHENOXYBUTYRIC ACID (2,4-DB)	NG/L	200.0	N/A
2,4,5-TP (SILVEX)	NG/L	20.0	10000 (A1)
BUTYLATE (SUTAN)	NG/L	2000.0	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.0	90000 (A1)
CARBOFURAN	NG/L	2000.0	90000 (A1)
CHLORPROPHAM (CIPC)	NG/L	2000.0	350000 (G)
CHLORPYRIFOS (DURSABAN)	NG/L	20.0	N/A
DIALATE	NG/L	2000.0	N/A
DIAZINON	NG/L	20.0	20000 (A1)
DICAMBA	NG/L	50.0	120000 (A1)
DICHLOROVOS	NG/L	20.0	N/A
EPTAM	NG/L	2000.0	N/A
ETHION	NG/L	20.0	35000 (G)
IPC	NG/L	2000.0	N/A
MALATHION	NG/L	20.0	190000 (A1)
METHYL PARATHION	NG/L	50.0	9000 (D3)
METHYLTRITHION	NG/L	20.0	N/A
MEVINPHOS	NG/L	20.0	N/A
PARATHION	NG/L	20.0	50000 (A1)
PHORATE (THIMET)	NG/L	20.0	2000 (A2)
PICHLORAM	NG/L	100.0	190000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.0	140000 (D3)
RELDAN	NG/L	20.0	N/A
RONNEL	NG/L	20.0	N/A
VOLATILES			
1,1-DICHLOROETHANE	UG/L	0.10	N/A
1,1-DICHLOROETHYLENE	UG/L	0.10	
1,2-DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2-DICHLOROETHANE	UG/L	0.05	5 (A1)
1,2-DICHLOROPROPANE	UG/L	0.05	5 (D1)
1,3-DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4-DICHLOROBENZENE	UG/L	0.10	5 (A1)
1,1,1-TRICHLOROETHANE	UG/L	0.02	200 (D1)
1,1,2-TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1,1,2,2-TETRACHLOROETHANE	UG/L	0.05	0.17 (D4)



TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLOROETHANOLBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
CIS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHYLENE OXIBROMIDE	UG/L	0.05	50 (D1)
ETHYLBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	65 (A5)
TRANS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)
VINYL CHLORIDE	UG/L	0.10	2 (D1)
RADIONUCLIDES			
TRITIUM	BQ/L	7.0	40000 (A1)
GROSS ALPHA COUNT	BQ/L	0.04	0.55# (D1)
GROSS BETA COUNT	BQ/L	0.04	N/A
COBALT 60	BQ/L	0.70	N/A
CESIUM 134	BQ/L	0.70	N/A
CESIUM 137	BQ/L	0.70	50 (A1)
IODINE 131	BQ/L	0.70	10 (A1)

# Equal to 15.0 Picocuries/litre

DRINKING WATER SURVEILLANCE PROGRAM  
PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1992, 109 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment and Energy (MOEE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

## DATA REPORTING MECHANISM

When the analytical results are transferred from the MOEE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOEE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

## PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

### Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

#### 1. PROCESS COMPONENT INVENTORY

All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

#### 2. TREATMENT CHEMICALS

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

#### 3. PROCESS CONTROL MEASUREMENTS

Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

#### 4. DESIGN FLOW AND RETENTION TIME

Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

#### 5. DISTRIBUTION SYSTEM DESCRIPTION

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

## 6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap); pump characteristics (model, type, capacity); and flow rate.

## 7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOEE personnel associated with the plant.

### Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

### Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

#### Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

#### Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOEE offices is being developed by the DWSP group.

#### Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOEE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

#### Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOEE Regional needs and to respond to public requests.

#### Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

## PARAMETER REFERENCE INFORMATION

NAME:	BENZENE
CAS#:	71-43-2
MOLECULAR FORMULAE:	$C_6H_6$
DETECTION LIMIT:	(FOR METHOD POCODO) 0.05 $\mu\text{g/L}$
SYNONYMS:	BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27) CYCLOHEXATRIENE (41)
CHARACTERISTICS:	COLOURLESS TO LIGHT-YELLOW, MOBILE, NONPOLAR LIQUID, OF HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN WITH SMOKING FLAME (30)
PROPERTIES:	SOLUBILITY IN WATER: 1780-1800 $\text{mg/L}$ AT 25C (41) THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER THRESHOLD TASTE: 0.5 $\text{mg/L}$ IN WATER (39) ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES, SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM SOILS OR ARE DEGRADED RATHER QUICKLY (80)
SOURCES:	COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES; COMBUSTION OF CAR EXHAUST. ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.
USES:	DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING AGENT; GASOLINE.
REMOVAL:	THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION, OXIDATION
ADDITIONAL PROPERTIES:	MOLECULAR WEIGHT: 78.12 MELTING POINT: 5.5°C (27) BOILING POINT: 80.1°C (27) SPECIFIC GRAVITY: 0.8790 AT 20°C (27) VAPOUR PRESSURE: 100 MM AT 26.1°C (27) HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41) LOG OCT./WATER PARTITION COEFFICIENT: 1.95 TO 2.13 (39) CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41) SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA



DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-220 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid ( $\text{HNO}_3$ ) (Caution: $\text{HNO}_3$ is corrosive)
Volatiles (duplicates) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle -fill bottle completely without bubbles
Organics (OWOC), (OWTRI)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Specific Pesticides (OWCP), (PEOP), (PECAR)	-as per Organics -three extra bottles must be filled
Polyaromatic hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate
Cyanide (Treated only)	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops sodium hydroxide ( $\text{NaOH}$ ) (Caution: $\text{NaOH}$ is corrosive)
Mercury	-250 mL glass bottle -rinse bottle and cap three times -fill to top of label -add 20 drops each nitric acid ( $\text{HNO}_3$ ) and potassium dichromate ( $\text{K}_2\text{Cr}_2\text{O}_7$ ) (Caution: $\text{HNO}_3$ & $\text{K}_2\text{Cr}_2\text{O}_7$ are corrosive)

Phenols	-250 mL glass bottle -do <u>not</u> rinse bottle, preservative has been added -fill to top of label
Radionuclides (as scheduled)	-4 L plastic jug -do <u>not</u> rinse, carrier added -fill to 5 cm from top
Organic Characterization (GC/MS - once per year) (PBVOL), (PBEXT)	-1 L amber glass bottle; instructions as per organic -250 mL glass bottle -do <u>not</u> rinse bottle -fill completely without bubbles

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.
2. Record time of day on submission sheet.
3. Record temperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.
6. No smoking in area of sample location.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid ( $\text{HNO}_3$ ) (Caution: $\text{HNO}_3$ is corrosive)

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.



5. Fill general chemistry and metals bottles.

6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-250 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid $\text{HNO}_3$ (Caution: $\text{HNO}_3$ is corrosive)
Volatiles (duplicate) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle, preservative has been added -fill bottle completely without bubbles
Organics (OWOC)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Polyaromatic Hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate

Steps:

1. Record time of day on submission sheet.

2. Let cold water flow for five minutes.

3. Record temperature on submission sheet.

4. Fill all bottles as per instructions.

5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.





